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Notice of Allowability	Application No.	Applicant(s)	
	09/922,203	BALAKRISHNAN ET AL.	
	Examiner	Art Unit	
	Tesfaldet Bocure	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 2/16/05.
2. ☒ The allowed claim(s) is/are 1-34.
3. ☒ The drawings filed on 03 August 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

REASONS FOR ALLOWANCE

1. The following is an examiner's statement of reasons for allowance: The following is a statement of reasons for the indication of allowable subject matter:

The claimed subject matter in claims 1-34 is allowable because the arts of record fail to teach or fairly suggest the claimed: "a method for use in a system that is adapted to transmit a data burst over at least two antennas, the method comprising the step of: transmitting at least two training sequences, each of the at least two training sequences being transmitted over a different respective antenna, each of the at least two training sequences having a ***normalized auto-correlation below an auto-correlation threshold, the auto-correlation threshold being significantly less than unity, and each pair of the at least two training sequences having a normalized cross-correlation below a cross-correlation threshold, the cross-correlation threshold being significantly less than unity*** as in claims 1 and 26;

a method for use in a system that is adapted to transmit a data burst over at least two antennas, the method comprising the step of:

transmitting at least two training sequences, each of the at least two training sequences being transmitted over a different respective antenna, the training sequences being shifted versions of each other, ***with each cyclic sequences having a normalized cyclic-auto-correlation below a cyclic-auto-correlation threshold, each cyclic sequence being N' , $N'=N-L+1$, symbols of one of the at least two training sequences, the cyclic-auto-correlation threshold being significantly less than unity***, L being the number of symbols over which multipaths of significant power can

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arrive, and N being the number of symbols in one of the training Sequences as in claim 12; and

a method for use in a system that is adapted to transmit a data burst over at least two antennas, the method comprising the step of:

transmitting at least two training sequences, each of the at least two training sequences being transmitted over a different respective antenna, ***a trace of an inverse of a product of a matrix of symbols of the at least two training sequences and a conjugate transpose of the matrix is below a trace threshold, the trace threshold being below $SML/IN-L+1$, L being the number of symbols over which multipaths of significant power can arrive, M being the number of training sequences, and N being the number of symbols in one of the training sequences*** as in claim 19."

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

2. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US patent publication numbers US 2003/00558926, US 2003/0013468, US 2004/0008760, US 2004/0223554 to Balakrishnan et al., Khatri, Dogan and Cha respectively and US patent number 6,600,776 issued to Alamouti et al. disclose a

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diversity transmitter for transmitter for transmitting training sequences having auto and cross-correlation properties.

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tesfaldet Bocure whose telephone number is (571) 272-3015. The examiner can normally be reached on Mon-Thur (7:30a-5:00p) & Mon.-Fri (7:30a-5:00p).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

T.Bocure

Tesfaldet Bocure
Primary Examiner
Art Unit 2631

